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USDA ■ Forest Service

## forest insect & disease management methods application group

2810 Chiles Rd. ■ Davis, Ca. 95616

September 1977 (4)

### NEWSLETTER

#### JOHN WONG JOINS MAG STAFF

John Wong has joined the MAG staff as Mathematical Statistician. A native of Rangoon, Burma, John attended the University of California at Berkeley and has earned degrees from the California State Universities at Hayward and San Francisco in Mathematics, Industrial Engineering, and Operations Research. Since 1967, he has had various assignments with the Department of the Army as a Mathematical Statistician and Operations Research Analyst. His most recent assignment was Operations Research Analyst at the Presidio in San Francisco.



*John Wong*

In his new assignment, John's principal duties will be implementing, documenting, updating, and maintaining mathematical models and data management systems for use by Regional and Area FI&DM staffs. Initially, he will be working very closely with scientists at Oregon State University on the model developed as a result of research sponsored by the USDA Expanded Douglas-fir Tussock Moth Research and Development Program.

#### COMPUTERIZED MAPPING

Bob Young, FI&DM-MAG Biometrician, has completed an evaluation of two closed polygon computerized mapping systems for potential use in forest and insect disease management. The systems evaluated were Wildland Resource Inventory System (WRIS), a system developed by Pacific Southwest Forest and Range Experiment Station in Berkeley, California, and PLOT, a system developed by the Pacific Northwest Region of the U.S. Forest Service in Portland, Oregon.

Each system is capable of providing:

1. Acreages of infested areas from aerial sketch map surveys.
2. A retrievable, historical data base for major forest insect and disease pests.
3. Summaries of acres infested by specific insects or diseases and land ownership class.
4. Acreage summaries showing annual changes in infestation boundaries.
5. A sampling frame for more intensive biological and impact evaluations.

For example; the mapping system permits stratification of an outbreak area into predetermined intensity classes for subsequent sampling. In addition, stratification can be based on successive years of infestation for planning impact surveys or defining control unit boundaries.

The comparison showed that PLOT was somewhat superior to WRIS, in that operating costs were less and turnaround time was more rapid. Bob is preparing a detailed report on this evaluation which will be distributed in several weeks.

#### MOUNTAIN PINE BEETLE DAMAGE SURVEYS

One of MAG's principal charters is to design and implement surveys for measuring losses caused by forest insects and disease. Presently, two pilot surveys utilizing multistage sampling techniques are being conducted to measure annual tree loss caused by mountain pine beetle in the Black Hills of South Dakota and the Targhee National Forest in Idaho. Forest Insect and Disease Management staffs from the Regional headquarters of the Forest Service in Denver, Colorado, and Ogden, Utah, will conduct the surveys, with MAG providing the technical assistance.

On July 5 and 6 the Targhee survey area, which covers more than 400,000 acres of infested lodgepole pine, was sketch mapped from the air. Following each day's flight the completed portion of the survey was traced onto a transparent overlay, and the area of each infestation polygon computed by use of electronic planimeter. Data was then returned to MAG where the polygons were stratified into three intensity classes by a data management system installed at the Ft. Collins Computer Center (FCCC). Once the strata were determined, flight lines and photo plot locations were placed on the map.

The aerial photography, originally scheduled to begin August 1, was postponed until August 8 because of slow crown discoloration (fading), particularly in the higher elevations. Lodgepole pine attacked by the mountain pine beetle, fades from the bottom of the crown to the top. Although this did not impair the sketch map survey, it can result in a significant omission error with vertical aerial photography.

The Black Hills survey concerns the infestation in ponderosa pine, totalling about one million acres. It was sketch mapped by Region 2 and MAG personnel during the week of August 1-5. Data is being compiled and strata determined similar to that done on the Targhee, but this time FCCC data will be accessed from the project base in Spearfish, South Dakota, by use of a portable computer terminal.

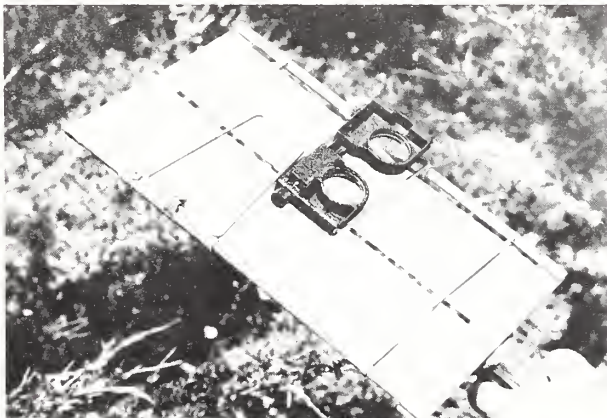


*Dayle Bennett of the Region 4 FI&DM staff defines infestation strata*

## FIELD STEREO VIEWER

One long standing problem in the conduct of aerial photographic surveys using 9 x 9 inch color transparencies, is stereo viewing of transparencies during acquisition of ground truth. Bill Klein, MAG Survey Systems Specialist, has designed a modified version of a field-going stereo viewer originally developed by Jule Caylor, Remote Sensing Specialist for the California Region of the Forest Service. The new viewer is compact (folds flat for placement in knapsack, etc.), lightweight, and versatile. A significant innovation is the adjustable, but fixed stereoscope which, when adjusted and locked, eliminates a nagging refocusing problem and affords one-hand operation. Once the stereo pair are properly adjusted, the entire stereo field can be panned from top to bottom by simply sliding the stereoscope along the tracks.

The stereoscope has been field tested and was found to perform satisfactorily. Plans are now underway to develop a self-contained viewing system that does not depend on sunlight for back lighting. This modified version would utilize a pair of miniature fluorescent tubes powered by batteries worn as a belt pack.



*Field Stereo Viewer*



*Viewing stereo pair with field viewer*

Plans for the viewer are available upon request from FI&DM/MAG.

## DEPOSIT ASSESSMENT MANUAL

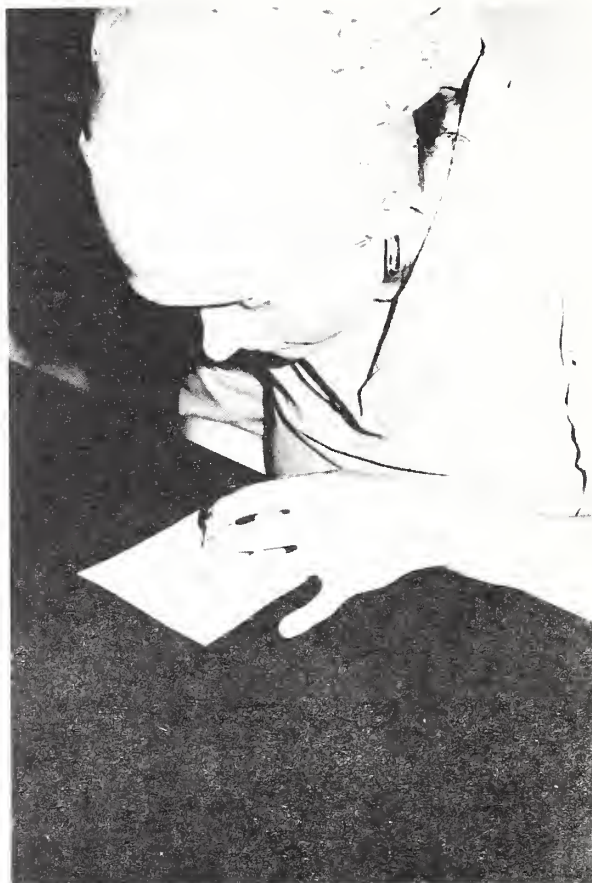
A draft of the handbook, "Sampling and Assessing Deposition of Insecticides Released Over Forests" has been distributed to the field for evaluation during the 1977 season. This handbook, compiled by Jack Barry of FI&DM-MAG, George Markin of the Pacific Southwest Forest and Range Experiment Station, and Robert Ekblad of the Missoula Equipment Development Center, is a direct result of a workshop on deposit assessment held in Davis, during March 1976. A final version of this handbook is scheduled for distribution in early 1978, and will be a joint publication of FI&DM-MAG and the USDA Expanded Douglas-fir Tussock Moth and Gypsy Moth R&D Programs.



## AIRCRAFT CHARACTERIZATION MANUAL

A publication entitled, "Field Manual for Characterizing Spray from Small Aircraft" by R.K. Dumbauld and J.E. Rafferty, of the H.E. Cramer Company of Salt Lake City, Utah, has been received and distributed. The purpose of this publication is to describe field and laboratory techniques to determine if contract spray aircraft are capable of applying specified droplet sizes and droplet density over a given swath. The techniques used give project directors the option of changing nozzles, adjusting nozzle orientation, pressure, etc., to assure that the spray applied to forested areas is within specific parameters. This publication resulted from a contract awarded to the H.E. Cramer Company by the USFS Missoula Equipment Development Center (MEDC) and FI&DM-MAG. Additional copies of this manual are available from U.S. Forest Service, FI&DM-MAG, Davis, California 95616.

During May 1977, FI&DM-MAG sponsored a training session in Davis to review aircraft calibration and instruct users in the techniques described in the afore mentioned field manual. Twelve students, representing five western FI&DM staffs of the U.S. Forest Service, the California Department of Food and Agriculture, and the Union Carbide Corporation, participated in this session. The course involved formal instructions and an actual calibration and characterization exercise at the airport of Medlock Dusters in Woodland, California.



*Lynne Whyte demonstrates techniques for sizing spray droplets*

## ASCAS-AERIAL SPRAY DEPOSIT DATA MANAGEMENT SYSTEM

Adaptation of ASCAS, a data management system for summarizing information from spray deposit cards to FI&DM needs, has been completed. The system is on line at U.S. Davis and USDA Ft. Collins Computer Centers. System documentation and user instructions are currently being prepared and will be issued as a special FI&DM-MAG report.

This system provides detailed summaries of droplet diameters and deposition densities and was made available to the U.S. Forest Service by the U.S. Army Dugway Proving Ground, Utah. Summaries can be made available on an individual card, sample tree, spray plot, or spray block basis. The objective is to make the system available to FI&DM field staffs or USFS Research, so that they can independently access the system through FCCC and analyze spray deposit data from field experiments, and pilot and operational control projects.

#### ROUND ROBIN EVALUATION OF QUANTIMET IMAGE ANALYZERS

A comparative evaluation of Quantimet 720 Image analyses of spray deposit card data recommended by participants of a spray deposit assessment workshop held in Davis during March 1976, has been completed. The results of this evaluation have been analyzed and published as a special report. Results indicate that there is a variation in stain diameter measurements between Quantimets, and the variation is greatest when measuring stain diameters less than 200 micrometers. Copies of the report are available from the FI&DM-MAG office at Davis, California.

#### AERIAL APPLICATION WORKSHOP

Jack Barry and Lynne Whyte, assisted the Northeastern Area of the Forest Service in conducting a 2-day workshop entitled, "Aerial Application of Insecticides Against Forest Defoliators." The session was held in Columbus, Ohio, during April and was attended by representatives from state, federal, university, and industry. Techniques for calibrating and characterizing spray aircraft, pesticide safety, spray block marking, and spray deposit sampling were discussed.

#### SOUTHERN PINE SEED ORCHARDS

Jack Barry, MAG Aerial Applications Specialist, assisted Larry Barber, FI&DM Asheville, North Carolina, Field Office, in identifying ways to improve application of insecticides with ground equipment for control of seed and cone insects in southern pine seed orchards. Jim Smith and Neil Overgaard, representing the Alexandria, Louisiana, Field Office, along with Jack and Larry, conducted an orchard spray demonstration at the Francis Marion National Forest Seed Orchard in South Carolina, to observe spray behavior and coverage. Several recommendations were discussed to improve application and are now in the process of being implemented throughout the southeastern states. Preliminary reports from the field indicate improved insect control in several orchards over 1976 as a result of this effort.

#### SUPPORT OF SPRUCE BUDWORM PILOT AND OPERATIONAL CONTROL PROJECTS

Several FI&DM-MAG staff specialists provided technical assistance to field experiments, and pilot and operational projects directed against eastern and western spruce budworms during the spring and early summer of 1977.

Dave Grumble, MAG Survey Entomologist, assisted George Markin of the Pacific Southwest Forest and Range Experiment Station in a field experiment of several dosages of the insecticide Reldan, against the western spruce budworm in the vicinity of McCall, Idaho.

Jack Barry assisted the Maine Forest Service and the U.S. Forest Service, Northeastern Area in sampling spray drift, aircraft performance, aircraft calibration and characterization, and deposit sampling for the Maine Spruce Budworm Project.

A team from FI&DM-MAG assisted the Southwest Region of the U.S. Forest Service with a pilot control project of the insecticide Sevin against the western spruce budworm in the Jemez Mountains of northern New Mexico. Pam Elam, MAG Secretary, served as the project administrative assistant; Jack Barry, Lynne Whyte, and Bill Ciesla, assisted with aircraft characterization and spray deposit sampling; and Bill Klein assisted in acquisition of aerial photography over the project site to serve as a base line for a long term evaluation of resource protection achieved by the spray application.

Bob Young and Bill Ciesla spent several days at McCall, Idaho, with the Intermountain Region FI&DM team providing assistance in deposit sampling and aircraft characterization for a pilot control project involving 1/2 pound Orthene per acre against western spruce budworm.

#### PEOPLE, PUBLICATIONS, AND PRESENTATIONS

Pam Elam, MAG secretary, has accepted position of payroll clerk, Humboldt Nursery, Six Rivers National Forest. While at her new location she plans to resume her studies at Humboldt State University in Arcata. We wish Pam the best of luck.

Dave Drummond, MAG Survey Pathologist, has been appointed general secretary for a symposium on dwarf mistletoe scheduled for April 11-13, 1978, in Berkeley, California. This symposium is jointly sponsored by the U.S. Forest Service Pacific Southwest Forest and Range Experiment Station and the University of California, Berkeley.

Bill Klein and Bill Ciesla were the recipients of USDA Certificates of Appreciation for their participation in the USDA Expanded Douglas-fir Tussock Moth Research and Development Program.

Pat Shea, Project Leader of the Research Work Unit PSW 2206-Field Evaluation of Chemical Insecticides, with whom we share office space in Davis, was a corecipient of a USDA Superior Service Award for his involvement in counseling and seeking employment opportunities for minorities in the Berkeley area. Congratulations Pat!

Ron Hanson, River Basin Planner, Region 5 Area Planning and Development staff, is now sharing office space with the MAG-PSW 2206 groups.

Billie Gualano, who has been a part-time clerk-typist for the MAG unit since May, has accepted a position with the Soil Conservation Service in Hollister, California.

Barry, J.W., W.M. Ciesla, M. Tysowsky, Jr., and R.B. Ekblad. 1977. Impaction of Insecticide Particles on Western Spruce Budworm Larvae and Douglas-fir Needles. J. Econ. Entomology 70(3), 387-388.

Grim, B.R. and J.W. Barry. 1976. A canopy penetration model for aerielly disseminated insecticide spray released above coniferous forests. Proceedings of the Fourth National Conference on Fire and Forest Meteorology, St. Louis, Missouri, November 16-18, 1976. pp. 109-115.

Barry, J.W., M. Tysowsky, Jr., G. Orr, R.B. Ekblad, R.L. Marsalis and W.M. Ciesla. 1976. Impaction of Zectran particles on spruce budworm larvae, a field experiment. Pesticide Spray Application Behavior and Assessment: Workshop Proceedings. USDA Forest Service, Pacific Southwest Forest and Range Experiment Station, Berkeley, California. General Technical Report PSW-15. 1976. pp. 40-47.



Whyte, L., J.W. Barry, and R. Young. 1977. Comparison of stain measurements on spray deposit cards by the Quantimet 720 Image Analyser. USDA Forest Service, Forest Insect and Disease Management, Methods Application Group, Davis, California. Report No. 77-1. pp. 18.

Grimble, D.G. and R.W. Young. 1977. Western Spruce Budworm Egg Mass-Defoliation Surveys. A working group progress report. USDA Forest Service, Forest Insect and Disease Management, Methods Application Group, Davis, California. Report No. 77-3. p. 21.

Ciesla, W.M., D. Cadahia and F. Robredo. 1976. La deteccion de plagas de insectos y enfermedades forestales. Boletin de Servicio de Defensa contra Plagas e Inspeccion Fittopatologica. 2:37-53.

Barry, J.W. and R.E. Ekblad. 1977. Deposition of Insecticide Drops on Coniferous Foliage. Paper No. 77-1041 prepared for presentation at the 1977 Annual Meeting, American Society of Agricultural Engineers, North Carolina State University, Raleigh, North Carolina. June 26-29, 1977. p. 13.

Jack Barry and Bill Ciesla each gave seminars at the Department of Agricultural Engineering, U.C. Davis during April 1977. Jack's topic was "Modeling Spray Behavior in Forest Pesticide Application," and Bill discussed "Aerial Application of Insecticides in Forests."

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